

REMARKS

STATUS OF CLAIMS AND SUPPORT FOR AMENDMENTS

Upon entry of this amendment, claims 1-5 and 8-13, and 15 will be pending in this application. Support for the amendment to claim 1 can be found in the specification at page 4, lines 24-26, and in Example 1.

ANTICIPATION REJECTION

In the Office action dated July 10, 2009, the Office has rejected claims 1, 5, 8-9 and 14-15 under 35 U.S.C. § 102(b) as anticipated by U.S. Reissue Patent No. 36,118 (Cupertino et al.). Applicant respectfully traverses this rejection for the reasons given below and in the response filed April 6, 2009, which is incorporated herein by reference.

The Office action states:

Regarding claim 1, US '118 teaches a method for separating a metal selected from the group of magnesium, copper, titanium, iron, zinc from an organic complex thereof (Col. 1, lines 8-10 of US '118). Though US '118 does not specify copper in monovalent [form], because the copper solution reacts with strong chloride solution, the monovalent copper as recited in the instant claim would have been inherently present in the aqueous solution of US '118. MPEP 2112 III & IV. US '118 teaches applying a chelating ring resin to extract the metal from the aqueous solution in the form of a complex of the metal and the extractant (Col. 1, lines 11-19 and examples 3-6 of US '118), which reads on the method of removal [of] impurities by contact [of] an aqueous [solution] with a chelating ion-exchange resin and removing the metal impurities from said solution using said chelating ion-exchange resin. US '118 teaches that the compound of organic phase are valuable for the selective extraction of antimony and/or bismuth contaminants from the highly acidic solutions used in copper refining (Col. 3, lines 19-27 of US '118).

Office action dated July 10, 2009 at pages 2-3 (emphasis added).

Applicant respectfully submits that this rationale contains numerous factual and legal errors, and that when these erroneous statements are corrected, it is very clear that Cupertino et al. does not anticipate Applicant's claim 1.

As Applicant has previously explained, the Office's reliance on Examples 3 and 4 of Cupertino et al. is misplaced. Both of these examples relate to a liquid-liquid extraction, and not to the use of an ion exchange resin.

With respect to the Office's reliance on Examples 5 and 6 and the disclosure of Cupertino et al. at column 1, lines 11-19 and column 5, lines 5-11, Applicant submits that these disclosures do not anticipate Applicant's claim 1 because they do not disclose every element recited in the claims arranged as recited in the claims, as is required in order for Cupertino et al. to anticipate the claims. See *Net MoneyIN Inc. v. VeriSign Inc.*, Fed. Cir., No. 07-1565 (October 20, 2008); *Connell v. Sears, Roebuck & Co.*, 722 F.2d 1542, 220 USPQ 193 (Fed. Cir. 1983); *In re Arkley*, 455 F.2d 586, 172 USPQ 524 (CCPA 1972). These examples are directed to the removal of antimony and bismuth using an ion exchange resin. No copper is disclosed in either example.

As the cases cited above make clear, the Office cannot simply pick and choose from among various different embodiments within a reference and cobble together all of the features recited in Applicant's claims in order to establish anticipation. Yet, this is what the Office has done in order to attempt to establish anticipation.

In an attempt at responding to Applicant's arguments, the Office asserts that:

Regarding arguments 1, 2, and 4, as pointed out in the rejection for claim 1, US '118 teaches that the compound[s] of [the] organic phase are valuable for the selective extraction of antimony and/or bismuth contaminants from the highly acidic solutions used

in copper refining (Col. 3, lines 19-27 of US'118). Though US'118 does not specify the copper in monovalent [form], because the copper solution reacts with strong chloride solution, the monovalent copper as recited in the instant claim would have been inherently present in the aqueous solution of US'118. MPEP 2112 III&IV. US'118 clearly teaches a contact of a copper ion containing solution with 0.5 moles of hydrochloric acid (Example 4 of US'118), which would inherently lead to form monovalent copper as recited in the instant claim 1.

Office action dated July 10, 2009 at pages 10-11.

First, as Applicant has previously explained, reliance on Example 4 of Cupertino et al. is inappropriate because it does not disclose the use of a chelating ion exchange resin, as recited in Applicant's claim 1.

Second, the Office appears to have missed the point of Applicant's argument, and as a result has failed to adequately address it. The mere fact that the Office relies upon four different examples of Cupertino et al. in order to cobble together a disclosure that the Office asserts falls within the scope of Applicant's claims compels the conclusion that the Office has failed to show that Cupertino et al. anticipates the claimed invention. As Applicant has previously explained, in order for Cupertino et al. to anticipate Applicant's claims, Cupertino et al. must disclose, within its four corners, every feature or element of Applicant's claims arranged as recited in the claims. See *Net MoneyIN Inc. v. VeriSign Inc.*, 545 F.3d 1359, 88 USPQ2d 1751 (Fed. Cir. 2008); *Connell v. Sears, Roebuck & Co.*, 722 F.2d 1542, 220 USPQ 193 (Fed. Cir. 1983); *In re Arkley*, 455 F.2d 586, 172 USPQ 524 (CCPA 1972).

In the *Net MoneyIN* case, a reference disclosed two separate protocols, neither of which contained each element arranged as recited in the claims at issue. The reference was found not to anticipate because, even though the protocols were both found within the four corners of a single reference, it was not proper to combine

their features to arrive at the claimed invention. Similarly, here the Office has combined the embodiments of at least two examples to two different embodiments disclosed in the reference. As in the *Net Money/N* case, such a combination cannot form the basis of an anticipation rejection, which "must clearly and unequivocally disclose the claimed [invention] or direct those skilled in the art to the [invention] without any need for picking, choosing, and combining various disclosures not directly related to each other by the teachings of the cited reference." See *In re Arkley*, 455 F.2d at 587.

The Office's comments completely fail to address this argument. Whether or not Cupertino et al. teaches that "the compound[s] of [the] organic phase are valuable for the selective extraction of antimony and/or bismuth contaminants from the highly acidic solutions used in copper refining" is irrelevant to the issue of whether the Office is justified in disregarding Federal Circuit precedent, or to the issue of how the present case is distinguishable from the Federal Circuit precedent cited above.

In addition, Applicant has previously explained that the Office's assertions that monovalent copper would inherently form in the process disclosed by Cupertino et al. is unsupported by any facts on this record. Cupertino et al. does not disclose that monovalent copper forms, as the Office has already admitted. Applicant has previously explained that Applicant's specification describes processes for producing monovalent copper that require several stages of counter current leaching in order to produce monovalent copper. No such process steps are disclosed in Cupertino et al. Moreover, even if contact of divalent copper ion with chloride ion in Example 4 of Cupertino et al. would form monovalent copper (which Applicant does not admit),

according to the express teachings of Cupertino et al. contact between the chloride stripping solution and the metal ions occurs only after the metal ion has been extracted or absorbed onto a resin.

This is significant because Applicant's claims recite that metal impurities are removed from an aqueous strong chloride solution of monovalent copper by the chelating ion exchange resin. In other words, a feedstock containing chloride ion, monovalent copper (the desired material), and other metals (the undesired impurities) is fed to a chelating ion exchange resin. An effluent stream from the resin containing the chloride ion and the monovalent copper, and depleted in the metal impurities, is obtained. The metal impurities are absorbed by the chelating resin in the presence of chloride ions.

By contrast, Cupertino et al. use a chloride solution as a stripping solution, i.e., they remove the absorbed metals from the resin. Cupertino et al. make this very clear and explicit:

The metal-loaded resin was separated and rinsed thoroughly with distilled water to remove traces of the aqueous feed solution.
Seven equal portions, of 1 g each, of the metal-loaded resin were separately contacted with 15 ml portions of aqueous strip solutions containing different concentrations of hydrochloric acid between 0.5 and 6 molar. A further seven portions of the metal-loaded resin were separately contacted with 15 ml portions of aqueous strip solutions containing different concentrations of chloride ion between 1.0 and 7.0 molar. The concentration of hydrochloric acid in each strip solution was 0.5 molar. The chloride ion concentration was varied by adding the required amount of CaCl₂. The stripping experiments were carried out at 20°-25° C. with a contact time of 2 hours.

Cupertino et al. at column 7, lines 52-66 (emphasis added). Cupertino et al., in effect, does the opposite of what Applicant has claimed, because Cupertino et al. use chloride ion to desorb divalent metal ions from an ion exchange resin. In

Applicant's claimed method, chloride ions are present when metal impurities are absorbed onto the resin.

Applicants respectfully submit that a worker having ordinary skill in this art would not have reasonably have expected to be successful in using a process that requires absorption of metal ions onto an ion exchange resin from a solution containing a material known to result in desorption of metal ions from ion exchange resins.

The Office's attempt to answer these arguments appears to consist of the statement that:

because the copper solution reacts with strong chloride solution, the monovalent copper as recited in the instant claim would have been inherently present in the aqueous solution of US'118.

Office action dated July 10, 2009 at page 10. The Office's assertion represents a fundamental misunderstanding of the nature of Applicant's claimed process and that of Cupertino et al.

First, the aqueous solution from which Cupertino et al. removes impurities is a strongly acidic sulfate solution. See Cupertino et al. at column 3, lines 34-37. Applicant submits that such a solution cannot contain copper in monovalent form since monovalent copper would oxidize under such conditions to form copper sulfate (i.e., to divalent copper).

Second, the Office appears to be under the mistaken impression that somehow monovalent copper will form in Cupertino et al. during the stripping step disclosed therein. It is unclear why the Office believes that this would occur, but it appears that the Office is using the incorrect logic that if conversion to monovalent copper happens in Applicant's claims, it must also inherently happen in the Cupertino

et al. process. This logic is incorrect because no such conversion occurs in the purifying step of Applicant's claims. The monovalent copper is in the same form before and after the purification step of the claims.

Third, the Office appears to have erroneously equated "a strong chloride solution," as recited in Applicant's claims, with the "strong acidic solution" of Cupertino et al. Logically, this equivalence is not supportable, as one can clearly have a strong chloride solution at only slightly acidic or neutral pH, as Applicant does in Example 1. While unnecessary to distinguish over Cupertino et al., Applicant has amended claim 1 so that this distinction will be unmistakable to the Office. A solution of about 10 g/l H₂SO₄ will, in general, have a pH of about 1. The acid content of the solution used in Cupertino et al. is about 145 to 210 g/l (see column 3, lines 34-37 of Cupertino et al.). This is many-fold above that corresponding to a pH of 1, so that the pH of such a solution is considerably less than 1.

For at least the reasons given above, Applicant respectfully submits that the Office has not shown (1) a single embodiment of Cupertino et al. that contains every feature of Applicant's claims, or (2) monovalent copper would inherently be present in the solution of Cupertino et al. Accordingly, the Office has failed to establish that Cupertino et al. anticipates Applicants' claim 1. Since claim 1 is not anticipated, the claims which depend from it are also not anticipated.

OBVIOUSNESS REJECTIONS

A. Claims 2-4 and 13 over Cupertino et al. in view of Partridge

In the Office action dated July 10, 2009, the Office has rejected claims 2-4 and 13 under 35 U.S.C. § 103(a) as obvious over Cupertino et al. in view of U.S. Patent No. 6,165,367 (Partridge). Applicants respectfully traverse this rejection for

the reasons given below and in the response filed April 6, 2009, which is incorporated herein by reference.

The Office action of June 25, 2008 states:

Regarding claims 2-4, US '118 teaches it is known in the arts that the organic complex is produced from an aqueous solution of metal salt with a chelating agent. This point is further evidenced by US '367. US '367 teaches a method for selectively removing a heavy metal from an aqueous waste [stream] and more particularly to methods for reducing the heavy metal content in the waste [stream] to sub-ppm level (Col. 1, Line 5-9 of US '367). US '367 teaches: ". . . providing a chelating resin containing amino-phosphonic group for capturing the heavy metal ions"; ". . . wherein the chelating resin is a styrene divinylbenzene copolymer . . ." (Claims 1-4 of US '367); US '367 teaches the resin' group can be "represented as: -NH-CH₂-PO₃Na₂" (Col. 2, Line 22-37); and US '367 also tests ". . . a chelating resin with iminodiacetic acid functional group . . ." (Col. 4, Line 38-41). Compared with the instant invention, US '367 overlaps the limitations related to chelating ion-exchange resins recited in the instant claims 2-4.

Office action dated July 10, 2009 at pages 5-6 (emphasis added).

First, as Applicant has previously explained, the Office's characterization of Applicant's claimed invention is inaccurate. Applicant's claims are not directed to "removing metal ions from an aqueous solution of metal salt with a chelating agent." Applicant's claims are directed to removing metal impurities from an aqueous strong chloride solution of monovalent copper using an chelating ion exchange resin, while leaving the monovalent copper in the aqueous chloride solution. This is not disclosed or suggested in Cupertino et al. for at least the reasons given above with respect to the Office's erroneous anticipation rejection.

Second, Partridge does not cure the deficiencies of Cupertino et al. noted above. Partridge discloses removing heavy metals, such as uranium, from a waste stream containing complexing anions. However, to the extent that chloride ion is considered such a complexing anion, Partridge only discloses a minor amount (i.e.,

less than 0.1 M in Example I). Nowhere does Partridge disclose or suggest that a strong chloride solution of monovalent copper could be purified of metal contaminants by passing the solution over a chelating ion exchange resin without absorption of the monovalent copper ion. Even if it were proper to combine Partridge were combined with Cupertino et al. (which Applicant does not admit), the result would not be Applicant's claimed method, but rather a method were all heavy metals are removed (including any monovalent copper) from an aqueous stream containing only minor amounts of chloride ion. This is not the method that Applicant has claimed.

With respect to claim 13, the Office asserts that it would have been obvious to reduce heavy metal content to a sub-pmm level because such a reduction is disclosed by Partridge, and that this somehow makes obvious the feature recited in claim 13 that metal impurities are reduced to a level that corresponds to cathode copper LME-A grade impurity level. What the Office appears to fail to recognize, however, is that the purity level recited in claim 13 is a purity level for copper. In other words, the copper that results from Applicant's claimed process is sufficiently pure that it meets the cathode copper LME-A requirements. This has nothing to do with the reduction of heavy metals in Partridge, however, since Partridge does not disclose any applicability to streams containing copper. Moreover, even if copper were present in a feedstock stream subjected to the process of Partridge, there is nothing in Partridge to suggest that copper would not also be reduced to a sub-pmm level, in which case there would essentially be no copper left in the stream to have its purity evaluated.

In its attempt to answer Applicant's arguments, the Office states:

Regarding arguments 3 and 4, the applicant's arguments are against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references.

Office action dated July 10, 2009 at page 11. Applicant has pointed out that, even if the references were combinable (which Applicant does not admit), the result would not be Applicant's claimed invention. Applicant explains why this is the case. How this constitutes "arguments against the references individually" is a mystery to Applicant. It is difficult to imagine a clearer argument against the combination of reference teachings than what Applicant has presented here (or indeed, a clearer instance of the Office completely failing to address Applicant's argument).

The Office goes on to state:

The motivations for combining these references can refer to [the] office action above. Still regarding argument 3, US'367 specifically applies the same chelating resin with aminophosphonic function group in a strong acid solution (Col. 1, lines 22-38 and Col. 2, lines 3-10 of US'367) as recited in the instant claim, a similar element selectivity would be highly expected, therefore, the process of US'367 will not reduce copper to sub-pmm level.

Office action dated July 10, 2009 at page 11. As Applicant has explained above, Applicant does not use a strong acid solution; it is the Office that has incorrectly assumed that the strong chloride solution is a strong acid solution. Accordingly, there is no basis or support for the notion that the process of Partridge would not reduce copper to sub-pmm levels, along with the other impurities being removed by the process disclosed therein.

For the reasons given above, Applicant respectfully submits that the Office has failed to establish a *prima facie* case of obviousness, and that this rejection should be withdrawn.

B. Claims 10-12 over Cupertino et al. in view of Hyvärinen et al.

In the Office action dated July 10, 2009, the Office has rejected claims 10-12 under 35 U.S.C. § 103(a) as obvious over Cupertino et al. in view of U.S. Patent No. 6,007,600 (Hyvärinen et al.). Applicants respectfully traverse this rejection for the reasons given below and in the response filed April 6, 2009, which is incorporated herein by reference.

The Office action dated June 25, 2008 states:

US '118 does not specify the detail process for applying NaCl and alkaline solutions. US '600 teaches: ". . . a countercurrent leaching of a sulfidic copper material, such as chalcopyritic copper concentrate, in a chloride milieu, so that the obtained product is essentially iron-free alkali chloride-copper chloride solution, where the copper is mainly monovalent . . ." (Col. 2, Line 44-67 and also refer to Fig. 1-3). US '600 shows ". . . the leaching is performed into a circulating NaCl solution . . ." (Col. 3, Line 35-46 and refer to Fig. 1-3). US '600 also teaches: "The precipitation is carried out by means of sodium hydroxide . . ." (Col. 4, Line 3-19, refer to Fig. 1-3 step 13). US '600 teaches the similar hydrometallurgical processes applying on the same copper-contained solution as recited in the instant invention. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to choose suitable NaCl and NaOH treatment in operation as demonstrated in US '600 in the process of US '118 because US '600 teaches the copper by hydrometallurgical chloride processes has the chance to make use of a lower degree of oxidation (Col. 2, Line 33-39 of US '600).

Office action dated June 25, 2008 at page 8 (emphasis added).

Applicant has previously explained that claim 10 relates to the process steps used to elute the absorbed metal impurities from the chelating ion exchange resin used in claim 1, and to regenerate it. The Office has not indicated where Hyvärinen et al. even disclose the use of an ion exchange resin, much less disclose the use of the method recited in claim 10 to elute absorbed impurities and regenerate the resin. Moreover, Applicants respectfully submit that Hyvärinen et al. does not cure the deficiencies of Cupertino et al. noted above.

Claims 11 and 12 relate to the use of hydroxide precipitation to remove the majority of metal impurities from the strong chloride solution of monovalent copper prior to contacting with an ion exchange resin. The precipitation described at column 4, lines 3-19 of Hyvärinen et al. is the precipitation of monovalent copper, not of impurities from the monovalent copper-containing stream. Again, the Office cites a reference that does the opposite of what Applicant is claiming, and relies on such a reference to allege that Applicant's claims are unpatentable. Even if it were proper to combine Hyvärinen et al. (which Applicant does not admit), the result would not be Applicant's invention because there is no disclosure of any monovalent copper in Cupertino to be precipitated out. Even if there were such a disclosure, there is no suggestion in either reference to precipitate out the monovalent copper before treatment with an ion exchange resin. For at least this reason, Applicant respectfully submits that the Office has failed to establish a *prima facie* case of obviousness, and that this rejection should be withdrawn.

In an attempt at responding to this argument, the Office again asserts that Applicant has argued the references individually. Again, Applicant points out that the Office appears to have misunderstood Applicant's argument. When Applicant argues that the combination of reference teachings does not result in a process that has every feature of Applicant's claims, this is arguing against the combination of references, and not against the references individually. Applicant notes that the Office has thus failed to answer Applicant's arguments.

Applicant notes that the Office has consistently and repeatedly failed to address the arguments raised by Applicant in any meaningful way. In view of this, Applicant requests that, in the even that the Office persists in making the erroneous

rejections discussed above, that the Office fully and completely answer Applicant's arguments in the next Office action, rather than waiting until an Appeal process is underway to address the arguments, as sometimes happens in these situations. Moreover, Applicant requests that, in the event that the Office persists in making these rejections, the Office make the next action non-final, since (assuming that the Office answers Applicant's arguments therein), this will be the first time that Applicant has had the benefit of the Office's position with respect to Applicant's arguments.

CONCLUSION

Applicant submits that this application is in condition for immediate allowance, and an early notification to that effect is respectfully requested. If the Examiner has any questions about this application, or believes that any issues remain to be resolved, the Examiner is respectfully requested to contact the undersigned to arrange for a personal or telephonic interview to resolve these issues prior to the issuance of another Office action.

Respectfully submitted,

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